



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/878,127	06/08/2001	Susan M. Connelly	RGP-0046	1149
23413	7590	04/20/2004	EXAMINER	
CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			LAM, CATHY FONG FONG	
			ART UNIT	PAPER NUMBER

1775

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

**Office Action Summary**

Application No.

09/878,127

Applicant(s)

CONNELLY ET AL.

Examiner

Cathy Lam

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on February 11<sup>th</sup> 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-88 is/are pending in the application.
- 4a) Of the above claim(s) 1-13 and 42-56 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-41 and 57-88 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/8/01-1/5/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

***Election/Restrictions***

1. This application contains claims 1-13 and 42-56 are drawn to an invention nonelected without traverse in Paper no. February 11<sup>th</sup> 2004. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 22-27, 35-40, 66-72, and 81-87 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Saito et al (US 5360672).

Saito teaches a laminate comprised of a liquid crystal polymer and a conductive metal foil. The laminate is used for forming printed circuit board (col 8 L 3-6).

The conductive metal foil is preferably a copper foil that has a thickness preferably in the range from 15-150  $\mu\text{m}$  (col 8 L 13-18). The copper foil is adhered to a liquid crystal polymer which is comprised of p-acetoxybenzoic acid and 6-acetoxy-2-naphthoic acid (col 9 L 1-14). The liquid crystal polymer was formed into a film having thickness of 80  $\mu\text{m}$  (col 9 L 19-21).

The examiner takes the position that the language “less than or equal to about 2 atomic %” and “up to about 1 atomic %” encompass zero atomic %. Therefore, Saito anticipates claims having these claim language.

Art Unit: 1775

The metallic film which can be a copper film, has a thickness from 10-100  $\mu$ m is plated onto the resin layer (col 3 L 63-67). The resin layer can be a liquid crystalline polymer such as liquid crystalline polyester (col 3 L 1).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 22-28, 35-41, 66-73 and 81-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al (US 5360672) in view of Lee et al (US 5908544).

Saito teaches a laminate that is used for a printed circuit board. The laminate is comprised of a liquid crystal polymer film and a copper foil.

Saito is silent about the copper foil having a dendritic layer, a hydrophobic layer or both.

Lee teaches a copper foil which is surface treated to include a dendritic or nodular surface (col 4 L 62-64). The copper foil is bonded to dielectric substrate(s) (col 6 L 37-38).

In view of the prior art teachings, it would have been obvious to include a dendritic layer in a copper foil because it enhances adhesion strength between dielectric substrate and the copper foil (col 1 L 28-36).

Art Unit: 1775

6. Claims 14-21, 29-34, 57-65 and 74-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al (US 5360672) in view of Kajiwara et al (US 4387006).

Saito discloses a laminate comprised of a liquid crystal polymer film and a conductive metal. The laminate is used for printed circuit board.

The conductive metal is preferably a copper foil having the thickness of 15-150  $\mu\text{m}$  (col 8 L 15-18). The liquid crystal polymer is comprised of p-acetoxybenzoic acid and 6-acetoxy-2-naphthoic acid (col 9 L 1-2). The liquid crystal polymer has a film thickness of 80  $\mu\text{m}$  (col 9 L 19-20).

Saito is silent about having a Zn and Chromium concentration on the copper foil surface. Saito is silent about having a dendritic layer and/or a hydrophobic layer on the copper foil surface. Saito is also silent about the percent loss of peel strength at the particular temperature, pressure and length of time.

Kajiwara teaches a copper foil that is bonded to an insulating layer for used as a printed wiring board.

The copper foil is initially roughened followed by electrolytically treated in a zinc chromate containing aqueous solution (col 2 L 20-25 & col 4 L 10-17).

In one example, Zn is in a concentration of 4 g/l and wherein the Cr is in a concentration of 10 g/l (Table 2, col 6 L55-57).

Kajiwara does not particularly state the concentration of Zn and Cr in atomic%, however one of ordinary skill in the art would easily modify the concentration because an optimum result can be obtained through routine experimentations.

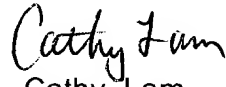
Art Unit: 1775

Regarding to the % loss of peel strength at the particular temperature and pressure, the examiner takes the position that such could be obtained once the concentration of the Zn and Cr were determined, and that applying a desired pressure and temperature for a desired length of time would give the desired peel strength.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Cathy Lam  
Primary Examiner  
Art Unit 1775

cfl  
April 13, 2004